

Case Series

Mesenteric vein thrombosis-bowel gangrene: a case series

Sampath Kumar*, Vijayalakshmi V., Nivetha Jayasankar, Kannan Ross

Institute of General Surgery, RGGGH and MMC, Chennai, Tamil Nadu, India

Received: 18 May 2022

Revised: 8 June 2022

Accepted: 16 June 2022

*Correspondence:

Dr. Sampath Kumar,

E-mail: sampathkumarmmcms@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Mesenteric vein thrombosis is a condition often misdiagnosed due to its vague and misleading clinical presentation which can cause intestinal angina, infarct, peritonitis. In patients with no peritonitis or evidence of gangrene, they can be managed conservatively with anti-coagulants. In this case series we discuss about various methods of presentation of patients with mesenteric vein thrombosis admitted in Rajiv Gandhi government general hospital during a time frame of June 2020 to April 2022 under institute of general surgery and management followed for different patients.

Keywords: Mesenteric vein thrombosis, Abdominal pain, Bowel, Gangrene, Infarction, Peritonitis, Anticoagulants, Case series

INTRODUCTION

Mesenteric venous thrombosis is an uncommon cause of mesenteric ischemia. Acute abdominal pain or chronic portal hypertension may be the presenting features. Rarely, it can be diagnosed as an incidental finding on abdominal CT scan. Prothrombotic states, surgery, inflammatory bowel disease and malignancy are common risk factors. The clinical presentation, outcome, extent of bowel infarction are all based on the size and extent of thrombosis. Infarction of the bowel mostly requires involvement of the venous arcades and vasa recta which in turn causes complete venous occlusion. Arterial vasospasm and thrombosis can also be a major factor leading to propagation of the ischemia and bowel infarction. The most common presenting symptom is abdominal pain, nausea, vomiting and melena. Usually the abdominal pain is out of proportion to the physical exam findings. Although melena, hematemesis or hematochezia can also occur. Fever and peritoneal signs are suggestive of progression of the infarction, and hypotension with systolic blood pressure of less than 90 mmHg along with ascites formation are associated with poor prognosis.

At rest, the bowel can tolerate marked reductions in blood flow because only 20% of capillaries are needed to provide adequate oxygen delivery to tissues. Even in periods of stress, the intestinal mucosa can augment oxygen extraction. However, with prolonged ischemia resulting from thrombotic occlusion, the ability of the intestinal capillaries to adequately provide oxygen is exhausted. Consequently, an inflammatory reaction occurs that can result in intestinal mucosal necrosis and ultimately disruption of the mucosal barrier. Intestinal bacteria may subsequently translocate into the bloodstream and abdominal cavity, resulting in sepsis, hemodynamic collapse, and multiorgan system failure.¹⁰ The number of patients with primary or idiopathic Mesenteric venous thrombosis has continued to decrease over last decade as our ability to diagnose inherited thrombotic disorders and to recognise hypercoagulable states improves.⁷ Between 6% and 29% of patients with acute Mesenteric vein thrombosis are hemodynamically unstable on presentation.¹¹ Mainstay of treatment are recanalization, prevention of propagation of the thrombosis which can lead to worsening of intestinal ischemia and on the long term, to prevent recurrences.

CASE SERIES

Case 1

A 40 years old admitted with complaints of abdominal pain for 2 weeks, abdominal distention with fever for past 1 week and obstipation. On admission, patient was having tachycardia with distended abdomen with mild tenderness. Complete blood count revealed high total count. CT showed thrombosis of aorta with superior mesenteric vein thrombosis with submucosal bowel wall edema. Initially patient was started on anti-coagulants and managed conservatively. But patients clinical condition worsened and Patient was taken up for emergency laparotomy. Intraoperatively, around 500ml serous toxic fluid noted with multiple filmy adhesions noted between jejunal loops and a jejunal loop of 100cm was found to be pregangrenous with areas of impending gangrene around 60cm from DJ flexure. Proceeded with resection of gangrenous bowel segment during which multiple thrombi were noted at the jejunal arcades (Figure 1). Resection done with primary anastomosis of jejunal ends. Post operatively, patient was continued on inj. heparin and then switched to oral anti-coagulants and discharged. Patient was followed up 4 months later and was having no complaints and was compliant to oral anticoagulants.

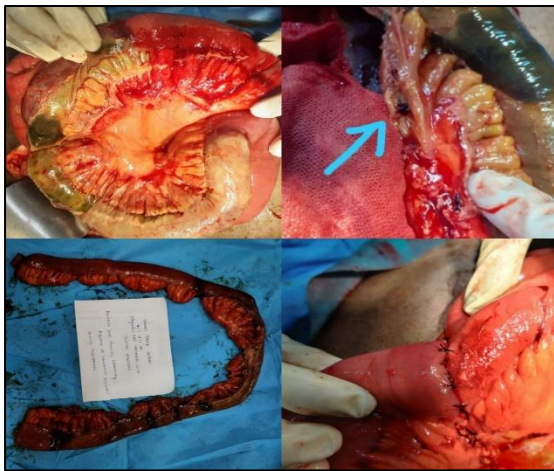


Figure 1: Pregangrenous and gangrenous bowel segments with resected specimen (blue arrow indicates thrombosis at jejunal arcade).

Case 2

A 25 year old admitted with complaints of abdominal pain for one week and obstipation for 2 days. Patients vitals were stable on admission and his abdomen was soft with mild distention and tenderness. His CT imaging (Figure 2) revealed superior mesenteric vein thrombosis with portal vein thrombosis with submucosal bowel wall edema with no signs of perforation. Initially patient was managed conservatively with anticoagulants. Despite anticoagulants, patient started having fever with progressive abdominal distention and hence taken up for

emergency laparotomy. Intra operatively, ischemia of distal jejunum with proximal ileum was noted. Proceeded with jejunostomy with ileostomy. Post operatively patient was discharged with oral anti-coagulants. Two months later patient was again readmitted and ostomy reversal was carried out and postoperative period was uneventful.

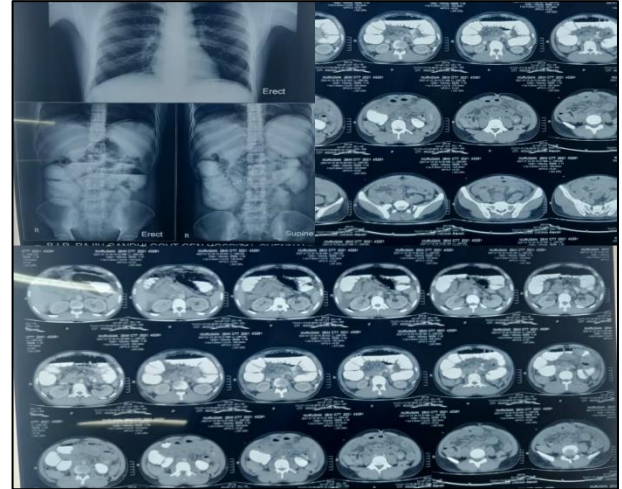


Figure 2: Superior mesenteric vein thrombosis with portal vein thrombosis with submucosal bowel wall edema and dilated bowel loops.



Figure 3: Gangrenous ileum and caecum.

Case 3

A 45 year old presented with complaints of abdominal pain for 1 month which has increased for the last 1 week with melena for one week and bilious vomiting for 3 days. She had no previous comorbidities with history of appendicectomy done at age of 16. On admission, she was tachycardiac with abdominal distention and diffuse tenderness and guarding. Contrast CT revealed aortic thrombosis and distal superior mesenteric vein thrombosis with hyperenhancement of distal ileum and caceum-possibility of bowel ischemia with large area of infarct in spleen. Patient taken up for emergency laparotomy. Intra operatively, omentum was seen wrapped around the entire bowel. Entire ileum was found to be gangrenous

upto 3 cm from ileocaecal junction (Figure 3). Proceeded with resection of gangrenous ileum and caecum followed by proximal jejunostomy and ascending colon mucous fistula. Post operatively patient was given nutritional advice and the nature of short gut syndrome. Patient was discharged with oral anticoagulants. Patient was again readmitted after 2 months in acute encephalopathy due to dyselectrolytemia which was corrected and discharged. 2 months later patient was again readmitted for ostomy reversal and intraoperatively patient was found to have contained cholangitic abscess with splenic abscess and hence proceeded with subtotal cholecystectomy with splenectomy. Anastomosis deferred in view of sepsis. Postoperatively patient could not be extubated and continued to be on ionotropic supports and eventually expired on Post operative day 2.

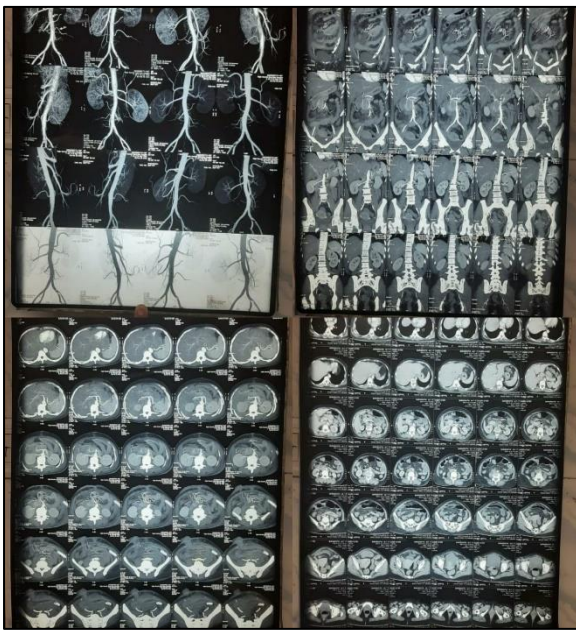


Figure 4: Short segment thrombosis of right colic artery and partial thrombosis of left common iliac artery, external iliac artery, internal iliac artery.

Case 4

A 44Y presented with complaints of lower abdominal pain with multiple episodes of vomiting for 4 days with high grade fever for 2 days. On admission, patient vitals pulse rate of 110 with right iliac tenderness and guarding. Contrast CT was taken and it showed sealed perforation of terminal ileum with possibility of focal ileal segment gangrene with secondary peritonitis. patient taken up for emergency laparotomy. Intra operatively, flakes over distal ileal loops were found with gangrene of distal ileum about 30cm 2cm from the ileocecal junction with ileal perforation. Proceeded with resection of gangrenous bowel segment and ileostomy with ascending colon mucus fistula. Post operatively, patient was taken CT Angiogram (Figure 4) which revealed short segment thrombosis of right colic artery and partial thrombosis of left common iliac artery, external iliac artery, internal

iliac artery. Patient was discharged with oral anticoagulants. Patient was again readmitted 6 weeks later with complaints of excessive bleeding per vaginum and diagnosed to have acitrome toxicity. Patient was then managed with fresh frozen plasma infusions and vitamin k injection and planned for ostomy reversal. Patient encountered surgical site infection post reversal and was managed with higher antibiotics and discharged after secondary suturing.

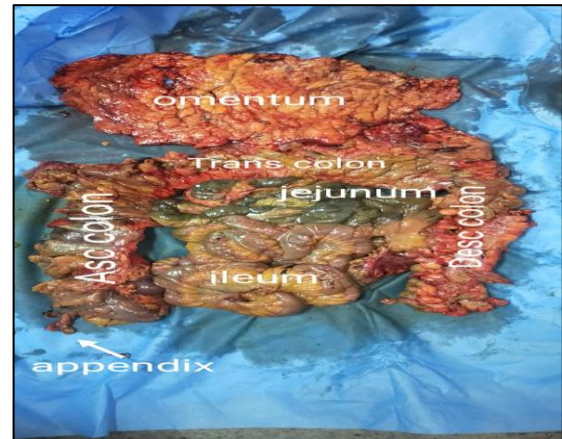


Figure 5: Resected gangrenous jejunum and ileum with pancolectomy.

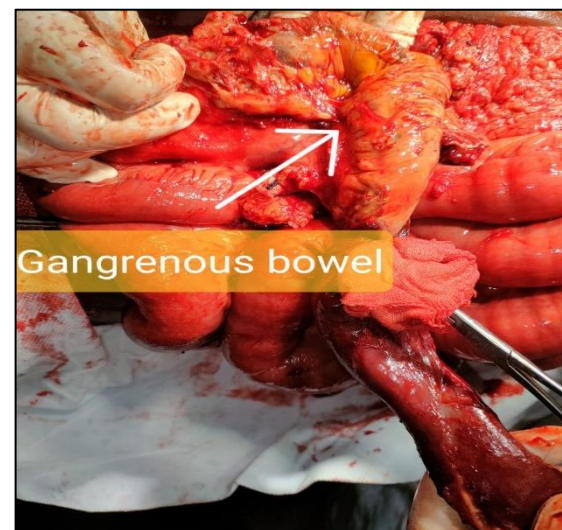


Figure 6: Gangrenous mid ileum.

Case 5

A 47Y admitted in intubated state with complaints of abdominal pain and obstipation for 3 days. He is a known hypertensive with history of cerebrovascular accident 7 years back. On admission, patient was intubated with hypotension on dual ionotropes with absent bowel sounds. Contrast CT revealed Superior mesenteric vessel thrombosis causing small bowel obstruction followed by perforation with pneumoperitoneum. He was resuscitated and taken up for emergency laparotomy. About 2 litres of

hemorrhagic toxic fluid was found and gangrene of bowel noted from 70 cm from duodenal jejunal flexure extending along entire ileum, colon upto proximal sigmoid (Figure 5). Multiple thrombi noted along the blood vessels. Proceeded with resection of gangrenous jejunum and ileum, pancolectomy with proximal jejunostomy and distal hartmanns pouch. Postoperatively patient could not be extubated and patient succumbed to sepsis.



Figure 7: End to end ileal anastomosis.

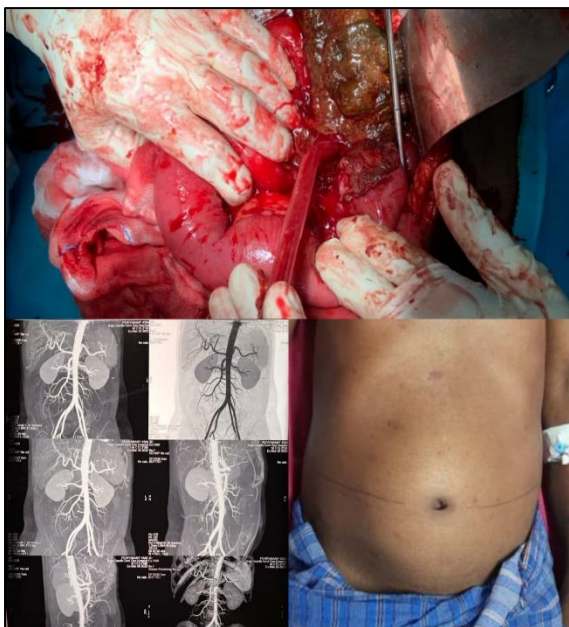


Figure 8: Intraop pic showing gangrenous ileum and preop lower abdomen distention.

Case 6

A 31Y presented with complaints of lower abdominal pain for 10days with melena for 3 days and abdominal distention. On admission, patient had mild abdominal

distention with diffuse tenderness and guarding. CT revealed pneumatosis intestinalis in ileum with Superior mesenteric vein thrombosis. Patient taken up for emergency laparotomy. Intra operatively, mid ileum was found to be gangrenous and clumped with omentum and adjacent bowel. Proceeded with resection of gangrenous bowel (Figure 6) and end to end anastomosis (Figure 7). Post operative period was uneventful. Patient was started on heparin and eventually changed to oral anticoagulants and discharged. Patient was followed up upto one year.

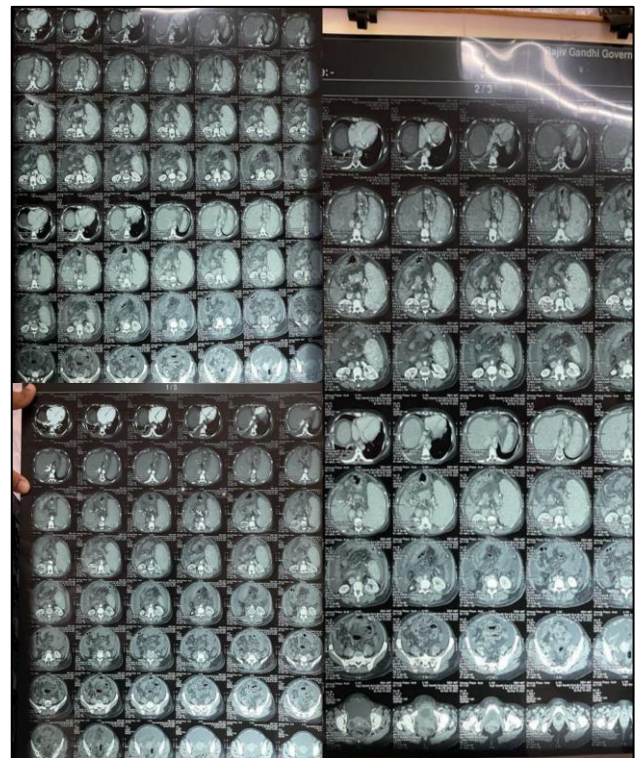


Figure 9: CT angiogram showing thrombosis at superior mesenteric vein and portal vein confluence with splenomegaly and chronic liver disease changes.

Case 7

A 53Y presented with complaints of lower abdominal pain for 1 week and obstipation. On admission patient vitals were stable with abdomen soft, mild tenderness in the lower abdomen. Contrast study revealed superior mesenteric vein thrombosis with submucosal bowel wall edema. Patient was managed conservatively initially with anti-coagulants. But patients abdominal pain worsened and hence taken up for emergency laparotomy. 20 cm proximal to ileocecal junction, around 60 cm of ileum was found to be gangrenous with sealed perforation with densely adherent omentum. Proceeded with resection of gangrenous segment with double barrel ileostomy.

Case 8

A 45Y admitted with complaints of abdominal pain for one week and distention for 3 days. Patient is a known

case of chronic liver disease with portal hypertension and splenomegaly. Contrast CT revealed Superior mesenteric vein and portal vein thrombosis. CT Angiogram revealed thrombosis at superior mesenteric vein and portal vein confluence. Patient was managed conservatively and discharged.



Figure 10: Superior mesenteric vein thrombosis with multiple air fluid levels.

Case 9

A 58Y admitted with abdominal pain for 7 days with distention for 3 days and vomiting for 3 days. On admission, patient was tachycardiac with distended abdomen with mild epigastric tenderness. CT showed superior mesenteric vein thrombosis with possibility of jejunal gangrene. On laparotomy, 60 cm jejunum was found to be gangrenous which was resected and primary anastomosis was done. Post operatively, patient was started on anticoagulation. On post operative day 5, patient developed anastomotic leak and hence proceeded with reexploration with tube duodenostomy. Patient expired in view of septic shock.

DISCUSSION

Acute mesenteric venous thrombosis is a rare but potentially fatal cause of abdominal pain, accounting for 6–9% of all mesenteric ischemia cases.¹ The clinical symptoms may be vague and misleading. The signs may not be correlating with the amount of gangrene setting in. It is evident in our case series wherein out of 9 cases, 4

were tried for conservative management but intraop finding turned out to be gangrene. Presentation of symptoms in mesenteric ischemia varies as in our case series some presented with acute abdomen with features correlating with obstruction and some presented with features of perforation and some with vague abdominal pain alone.

Early diagnosis is important to prevent full blown gangrene which might go in for perforation followed by peritonitis. Clinical findings along with radiological studies should make a earlier and correct diagnosis in knowing the appropriate pathology and so as to plan the correct modality of management. The true incidence of chronic MVT is likely to be underestimated because it is often asymptomatic. Two large series demonstrated that chronic mesenteric vein thrombosis accounts for 24% to 40% of total cases.⁹ Conventional contrast material enhanced CT which allows sensitive detection of venous thrombosis within central large vessels of the portal-mesenteric circulation, helical CT angiography has become the primary diagnostic modality in our clinical management. Magnetic resonance imaging also has excellent sensitivity and specificity for the diagnosis.⁷ Mesenteric vein thrombosis accounts for 1 in 5000 to 15 000 inpatient admissions and 1 in 1000 emergency surgical laparotomies for acute abdomen.⁸

No single laboratory marker is sensitive or specific for the diagnosis of Mesenteric vein thrombosis. Although high serum lactate levels and metabolic acidosis correlate with increased mortality, normal serum lactate and pH do not exclude MVT.^{12,13} Profound leukocytosis, often exceeding 20 000 cells/ μ L, may be the only initial laboratory abnormality.¹⁴

Radiological signs include defective canalization of the superior or inferior mesenteric vein, which can extend to the splenic and portal vein and occasionally reach the intrahepatic portal bifurcation. Signs of intestinal ischemia include mesenteric edema, small bowel edema and wall thickening, dilated bowel loops, intestinal pneumatosis and ascites.² In a Swedish retrospective study on a series of 102 patients, mesenteric edema, small bowel wall edema, small bowel dilation and ascites were associated with higher bowel resection rate. Among these factors, small bowel edema represented an independent risk factor for intestinal resection.³ Kim et al identified the extent of thrombosis as another risk factor for bowel resection. Leukocyte count and neutrophil-to-lymphocyte ratio, mean platelet volume, lactate dehydrogenase, D-dimer, serum lactate, red cell distribution width and transaminases can all have a role in assessing the severity of mesenteric ischemia rather than in its diagnosis.⁴ Mesenteric vein thrombosis may be the first sign of an undiagnosed cancer, such as myeloproliferative neoplasms, which can be better identified by testing for Jak2 V617F mutations), or intra-abdominal solid tumors.⁵ The treatment includes use of anticoagulants and if gangrene sets in to proceed with surgery. The type of

surgery depends on individual patients general condition, intraoperative risk assessment, amount of contamination, level of gangrene. In our case series of 9, only 3 patients underwent primary anastomosis of which one patient developed anastomotic leak rest 5 patient underwent ostomies of which reversal was done in 2 patients and only one patient was diagnosed conservatively. Lifelong anticoagulation is recommended; however, for patients with proven, inherited or acquired thrombophilia, as well as for patients with recurrent vein thrombosis or if recurrent thrombosis could have severe clinical consequences.⁶

CONCLUSION

Mesenteric vein thrombosis is a condition wherein symptoms and signs would not be correlating to the pathology happening thus misguiding us towards wrong treatment goals. Hence bowel gangrene in case of mesenteric vein thrombosis must be identified early and surgical procedure must be undertaken appropriately. This case series reveals various ways of clinical presentation of patients with mesenteric vein thrombosis and in some cases subtle clinical signs mislead us towards conservative management which eventually failed so as to take up on surgery. It also reveals variations in different cases of the length/segment of bowel affected, amount of gangrene/various age groups and the different types of surgical resection individualised followed by either primary anastomosis/ostomy. It also tells us the various complications patient underwent including perforation peritonitis, sepsis, oral anticoagulant toxicity, metabolic complications, anastomotic leak, etc.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

REFERENCES

1. Sulger E, Gonzalez. Mesenteric Venous Thrombosis Stat Pearls. Treasure Island, FL: StatPearls Publishing. 2019.
2. Wang Y, Zhao R, Xia L, Cui YP, Zhou Y, Wu XT. Predictive risk factors of intestinal necrosis in patients with mesenteric venous thrombosis: retrospective study from a single center. *Can J Gastroenterol Hepatol*. 2019;2019:8906803.
3. Salim S, Ekberg O, Elf J, Zarrouk M, Gottsäter A, Acosta S. Clinical implications of CT findings in mesenteric venous thrombosis at admission. *Emerg Radiol*. 2018;25:407-13.
4. Khan SM, Emile SH, Wang Z, Agha MA. Diagnostic accuracy of hematological parameters in acute mesenteric ischemia-a systematic review. *Int J Surg*. 2019;66:18-27.
5. Salim S, Zarrouk M, Elf J, Gottsäter A, Sveinsdottir S, Svensson P, et al. Clinical implications of different risk factor profiles in patients with mesenteric venous thrombosis and systemic venous thromboembolism: a population-based study. *J Thromb Thrombolysis*. 2019;47:572-7.
6. Björck M, Koelemay M, Acosta S, Goncalves F, Kölbel T, Kolkman JJ, et al. Management of the diseases of mesenteric arteries and veins: clinical practice guidelines of the European Society of Vascular Surgery (ESVS). *Eur J Vasc Endovasc Surg*. 2017;53:460-510.
7. Zhang J, Duan ZQ, Song QB. Acute mesenteric venous thrombosis: a better outcome achieved through improved imaging and a changed policy of clinical management. *Eur J Endovasc*. 2004;28:329-34.
8. Harnik IG, Brandt LJ. Mesenteric venous thrombosis. *Vasc Med*. 2010;15:407-18.
9. Kumar S, Kamath PS. Acute superior mesenteric venous thrombosis: one disease or two? *Am J Gastroenterol*. 2003;98:1299-304.
10. Moore EE, Moore FA, Franciose RJ, Kim FJ, Biffl WL, Banerjee A. The postischemic gut serves as a priming bed for circulating neutrophils that provoke multiple organ failure. *J Trauma*. 1994;37:881-7.
11. Singal AK, Kamath PS, Tefferi A. Mesenteric venous thrombosis. *Mayo Clin Proc*. 2013;88:285-94.
12. Filsoofi F, Rahmanian PB, Castillo JG, Scurlock C, Legnani PE, Adams DH. Predictors and outcome of gastrointestinal complications in patients undergoing cardiac surgery. *Ann Surg*. 2007;246:323-9.
13. Oldenburg WA, Lau LL, Rodenberg TJ, Edmonds HJ, Burger CD. Acute mesenteric ischemia: a clinical review. *Arch Intern Med*. 2004;164:1054-62.
14. Akyildiz H, Akcan A, Oztürk A, Sozuer E, Kucuk C, Karahan I. The correlation of the D-dimer test and biphasic computed tomography with mesenteric computed tomography angiography in the diagnosis of acute mesenteric ischemia. *Am J Surg*. 2009;197:429-33.

Cite this article as: Kumar S, Vijayalakshmi V, Jayasankar N, Ross K. Mesenteric vein thrombosis–bowel gangrene: a case series. *Int Surg J* 2022;9:1344-9.